

der, diagonal, gray-pollinose bands, most conspicuous upon the fourth segment.

*Male*.—Length 14 mm; wing 10 mm.

Head: occiput tumid, silvery gray pollinose, the crease very conspicuous. Vertex shining brown, somewhat convex, becoming light chestnut-brown on a wedge behind the ocelli. Eyes approximate, failing to touch by a distance equal that between the posterior ocelli. The front is shining brown. Face dark brown, shining. There is a narrow, transverse band of yellow pubescence across the face at the epistoma and up narrowly along the eye margins. Antennae short, wholly reddish brown, the third joint about twice as long as wide, dully pointed. Eyes bare.

Thorax: black, feebly shining; microscopically pilose, mixed black hairs among brownish yellow hairs. There is a rugose area on each light-brown humerus, and on each medial edge of the humerus there is a similar area that immediately divides to form slender stripes running the greater part of the thorax. Scutellum broad, very convex, dark brown. The pleura are black with a narrow, vertical, silvery stripe. There is a tuft of long, golden-yellow hair on the anterior margin of the propleura. Squamae rather short, pale in color.

Abdomen: rather elongate, basally petiolate, the first and second segments and the basal third of the third segment with almost parallel sides. Actually the first segment is a little wider than the second and the club-shaped fourth

segment and terminal part of the third segment are three times as wide as the second segment. Abdomen subcylindrical, the fourth segment considerably longer than the third segment, the third segment barely shorter than the second segment. Abdomen shining black, chiefly dark brownish black on the fourth segment, with a diagonal, grayish-silvery pollinose stripe on the sides of the second segment before the middle, widely interrupted. There is a similar diagonal stripe in the opposite direction on the third segment and on the fourth segment a diagonal, subbasal, silvery-gray stripe practically continuous across the middle. Pile of abdomen flat, bristly, black except on the light pollinose area where it is pale yellowish. Sides of third and fourth segments strongly curved over.

Legs: chiefly dark brown, the base of all the femora, the basal third of all the tibiae yellowish. The apical half of the anterior femora beyond the strong basal bulge and bend are light reddish brown. Hind femora slightly thickened basally.

Wings: nearly hyaline, clear brownish along the anterior marginal edge to the end of the costa. Third longitudinal vein straight without spur into the first posterior cell. There is a spur from the fourth longitudinal vein into the first posterior cell near the end of the vena spuria.

*Holotype*.—One male. Port St. John, Ponderland, November 1923, South Africa, R. E. Turner, 1924-6. In the British Museum.

ZOOLOGY.—*Zoael larvae of the blue crab* *Callinectes sapidus Rathbun*.<sup>1</sup> MILDRED SANDOZ, Virginia Fisheries Laboratory, and SEWELL H. HOPKINS, Texas A. and M. College. (Communicated by WALDO L. SCHMITT.)

In 1942 eggs of the blue crab were hatched in the laboratory under favorable and unfavorable environmental conditions. Controlled experiments showed that under favorable conditions blue-crab eggs hatch into normal first crab zoeae. Eggs heavily infected with fungi or bacteria and those kept under unfavorable salinity and temperature conditions either failed to hatch or hatched into prezoae that usually died soon. The optimum salinity range for hatch-

ing was found to be about 23 to 30 parts per thousand. Eggs failed to hatch outside the temperature range of 19°-29° C. Churchill (1942) concludes that there is a prezoael stage in the blue crab. Our data clearly show that occurrence of prezoae after hatching is not a normal one, but a result of development under unfavorable environmental conditions. Williamson (1910), working on *Portunus puber*, also of the family Portunidae, states that the larvae were obtained in the first zoael stage.

<sup>1</sup> Received January 19, 1944.

In studies on development the first three zoeal stages were reared in the laboratory. The first and second zoeae were found to correspond with the descriptions and drawings of these larvae by Hopkins (1943) and in most respects with the characteristics presented by Churchill (1942). The third zoeae, however, showed marked differences from the third zoeae described by Churchill (1942). The three significant morphological differences are: (1) There are eight swimming setae on the exopodites of the first and second maxillipeds; (2) the exopodite of each antenna is still short as in the second zoea, not prominent as in Churchill's third stage; and (3) there are no strong dorsal spines on the fifth abdominal segment. Churchill states that (1) the exopodite of the first maxilliped has six setae and the second maxilliped has seven; (2) each antenna bears a prominent exopodite; and (3) there appears for the first time a pair of large strong spines on the dorsal side of the fifth segment. He figures a prominent chromatophore in the basipodite of the first maxilliped of the third stage, but his fourth and fifth stages lack a corresponding chromatophore. This phenomenon, if true, is most unexpected, since carcinologists appear to agree on the constancy of pigment

characters for purposes of larval identification (Williamson, 1910, and Behre, 1941).

Churchill's description of the third stage is based on zoeae collected in plankton tows and not on larvae reared under observation. It represents a zoeal stage of another crab. Also, his fourth and fifth stages do not seem to be larvae of the blue crab.

As pointed out by Hopkins (1942), the fact that other portunid crabs are known to occur in the lower part of the Chesapeake Bay and in the ocean just outside of the bay makes it seem dangerous to draw too definite conclusions as to the identity of the zoeal stages on a basis of plankton tows alone.

#### REFERENCES

- BEHRE, ELLINOR. *The recognition of crustacean larvae by their pigment patterns*. Anat. Rec. **81** (4): 1160. 1941.
- CHURCHILL, E. P. *The zoeal stages of the blue crab, Callinectes sapidus Rathbun*. Chesapeake Biol. Lab. Publ. 49. Apr. 1942.
- HOPKINS, S. H. *The external morphology of the first and second zoeal stages of the blue crab, Callinectes sapidus Rathbun*. Trans. Amer. Micr. Soc. **62** (1). Jan., 1943.
- WILLIAMSON, H. C. *Report on the larval and later stages of Portunus puber L., P. decurcator Leach, P. holsatus Fabr.* Fish. Scot. Sci. Invest. No. 1 (1909): 1-20. 1910.

## PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

### ANTHROPOLOGICAL SOCIETY

The Anthropological Society of Washington at its annual meeting held on January 18, 1944, elected the following officers: President, T. DALE STEWART; Vice President, REGINA FLANNERY; Secretary, WILLIAM N. FENTON; Treasurer, WALDO R. WEDEL; Members of the Board of Managers, W. M. COBB, WM. H. GILBERT, H. W. KRIEGER, ALFRED MÉTRAUX, JULIAN H. STEWARD.

A report of the membership and activities of the Society since the last annual meeting follows:

Life members, 1; active members, 53; associate members, 13; total, 67. This represents an increase of 13 over last year.

The members elected during the year were: DR. GORDON T. BOWLES, Mrs. MARION HALE BRITTON, DR. EDWIN G. BURROWS, Miss ELIZABETH PEARSON CLARK, JOHN HADLEY COX, DR. JAMES A. FORD, PHILIP EDWARD FOWLER, Mme. NADYA GEORGES-PICOT, DR.

KATHERINE LUOMALA, Dr. A. MÉTRAUX, Dr. MAURICE A. MOOK, Miss RUTH E. PARDEE, ROBERT L. RANDES, Dr. DEMITRI B. SHIMKIN, DR. GORDON R. WILLEY, active members; Mrs. MARJORIE LISMER BRIDGES, Capt. WENDELL P. ROOP, U.S.N.R., Dr. AFIF I. TANNOUS, Lt. Col. GEORGE WILLIAMS, associate members.

Two members, Dr. ALEŠ HRDLIČKA, life member, and Dr. SOPHIE NORDHOFF-JUNG, associate member, were lost by death. The Society voted to record its deep sense of loss at the death of these members and to extend its sincere condolences to their relatives.

The Treasurer's report is as follows:

Funds invested in Perpetual Building Association (with interest to date)	\$1,762.92
21 shares Washington Sanitary Improvement Co. No. 505 (par value \$10 per share).....	210.00
2 shares Washington Sanitary Housing Co., No. 222 (par value \$100 per share).....	200.00